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Mussurana quimi (Franco, Marques & Puorto, 1997) (Serpentes: Dipsadidae): first records for Rio Grande do Sul, southern Brazil

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Abstract: *Mussurana quimi* is a species of Pseudoboini known from central, southeastern, and southern Brazil, Paraguay, and northeastern Argentina. We report the occurrence of this species in the state of Rio Grande do Sul, Brazil, based on two specimens from Santa Maria municipality. This report extends this species' distribution about 950 km south from its type locality and 330 km south from the nearest previous locality record (Posadas, Argentina). It also represent new southernmost records for *M. quimi*. We also provide brief comments on coloration and morphological variation of this species as well as an updated distribution map.

Keywords: Pseudoboini; geographical distribution; Atlantic Forest; morphological variation

Mussurana Zaher, Grazziotin, Cadle, Murphy, de Moura-Leite & Bonatto, 2009 is a recently described genus of Pseudoboini that encompasses *Mussurana bicolor* (Peracca, 1904), *M. montana* (Franco, Marques & Puorto, 1997), and *M. quimi* (Franco, Marques & Puorto, 1997) (Zaher et al. 2009); diagnostic characters are the color pattern, hemipenis with an unique row of larger papillae on the internal face of the lobes, postero-ventral tip of the nasal gland longer than wide, and a reduced dorsal wall of the Duvernoy gland (Zaher 1994, 1999).

Mussurana quimi was described based on a type series from the Brazilian state of São Paulo, with additional specimens from Distrito Federal, Espírito Santo, Minas Gerais, Paraná, and Santa Catarina, also in Brazil (Franco et al. 1997). Later, Giraudo (1999) reported a specimen from Misiones, northeastern Argentina, and Scott-Jr. et al. (2006) presented the first records for Paraguay.

In Rio Grande do Sul, similar species have been recorded: *Boiruna maculata* (Boulenger, 1896), *Clelia hussami* Morato, Franco & Sanches, 2003, *Clelia plumbea* (Wied-Neuwied, 1820), *M. bicolor*, *Paraphimophis rusticus* (Cope, 1878), and *Pseudoboa haasi* (Boettger, 1905) (Abegg & Entiauspe-Neto 2012). The overall adult coloration pattern of *M. quimi* readily distinguishes it from *B. maculata* (which presents a black dorsum with red on its dorsolateral surfaces), *C. hussami* (reticulated brown dorsum with a vertebral stripe), and *P. rusticus* (reticulated beige or brown).

Although similar to *B. maculata* and *C. plumbea*, species with which it may be sympatric, *M. quimi* can be distinguished from these by its fewer ventral scales, ranging from 186–205 in number (Scott-Jr. et al. 2006); from *P. haasi*, by its paired (vs. entire) subcaudals (Giraudo 2003); from *M. bicolor* and *M. montana*, by a combination of pholidosis, coloration and snout shape (Franco et al. 1997).

While examining specimens of Pseudoboini in the Herpetological Collection of Universidade Federal de Santa Maria (UFSM), Rio Grande do Sul, Brazil, we came across two unidentified individuals (ZUFSM 2511, 2533) collected on the UFSM campus (–29.7150, –53.7164; WGS 84). On

Figure 1. Dorsal and ventral views of *Mussurana quimi* from Universidade Federal de Santa Maria, Rio Grande do Sul, Brazil. **A.** ZUFSM 2533. **B.** ZUFSM 2511.

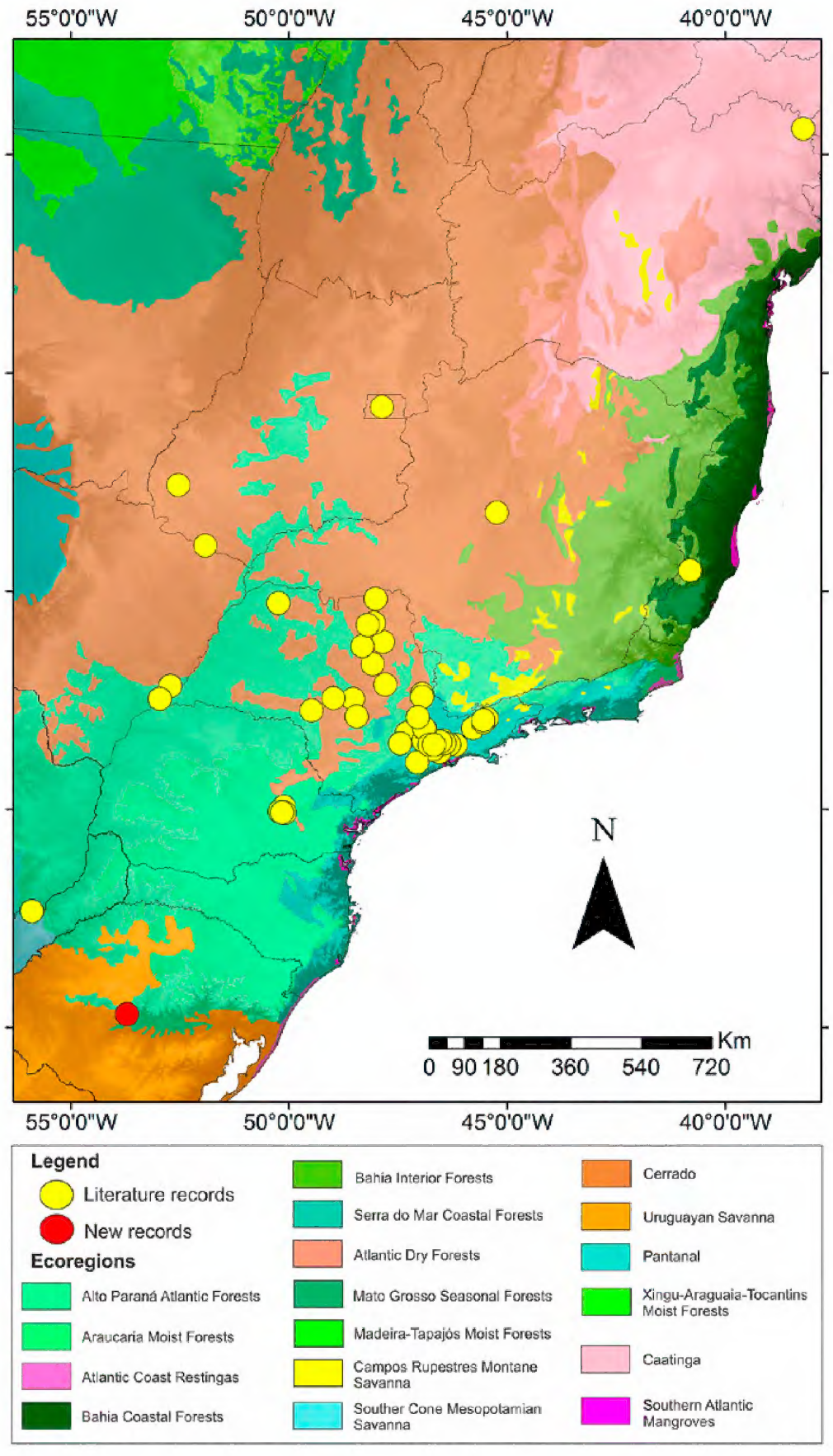

Figure 2. Updated distribution map for *Mussurana quimi*. Red dot: new record; yellow dots: literature records from GIRAUDO (1999, 2003); SCARTOZZONI (2005); SCOTT-JR. et al. (2006); SILVEIRA & COTTA (2006); FRANÇA et al. (2008); VAN-SILVA et al. (2008); BÉRNILS (2009); VALDUJO et al. (2009).

closer examination, we concluded these were specimens of *Mussurana quimi*, which are the first specimens from the state of Rio Grande do Sul. Measurements are shown below; bilateral variation is indicated as Left/Right.

ZUFSM 2511 (Figures 1 and 2) is an adult female, collected on 3 May 2004. It has a dark gray dorsum with two light brown dorsolateral stripes, cream venter, ventral surface of tail cream with black edges of the subcaudals; dorsum of head dark gray, supralabials dark gray on the upper half and cream on the lower half. Dorsal scale rows 19-19-17, ventrals 195, subcaudals in 71 pairs, supralabials 8/9, infralabials 8/8, SVL 873 mm, tail length 250 mm, trunk length 850 mm, and head length 23 mm.

ZUFSM 2533 (Figures 1 and 2) is an adult female, collected on 5 August 2004, presenting the same coloration as ZUFSM 2511 but with less conspicuous lateral stripes. Dorsal scale rows 19-19-17 , ventrals 187, subcaudals in 63 pairs, supralabials 8/8, infralabials 8/9, SVL 859 mm, tail length 210 mm, trunk length 830 mm and head length 29 mm. The ventral scale range of *M. quimi* reported in FRANCO et al. (1997), 193–207 in females, is herein extended to 187–207.

These specimens represent the first records of *Mussurana quimi* from the state of Rio Grande do Sul, extending its distribution 330 km from its previous southernmost record in Posadas, Argentina, and 947 km from its type locality in Itu, São Paulo, Brazil (Table 1). This is a new southernmost record for the species located in the Alto Paraná Atlantic Forests ecorregion (OLSON et al. 2001).

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Table 1. Updated geographical distribution of *Mussurana quimi*.

Country	State/province/department	Municipality (locality)	Latitude	Longitude	Source of record
Argentina	Misiones	Posadas	–27.3500	–55.9000	SCOTT-JR et al. (2007)
Brazil	Santa Catarina	São Bento do Sul	–26.2500	–49.3833	FRANCO et al. (1997)
Brazil	Paraná	Carambeí	–24.9500	–50.1166	BÉRNILS (2009)
Brazil	Paraná	Jaguariaíva	–24.2500	–49.7166	BÉRNILS (2009)
Brazil	Paraná	Ponta Grossa (campus UEPG)	–25.0916	–50.1000	BÉRNILS (2009)
Brazil	Paraná	Ponta Grossa (Borato)	–25.0666	–50.2166	BÉRNILS (2009)
Brazil	Paraná	Ponta Grossa	–25.0833	–50.1666	BÉRNILS (2009)
Brazil	Rio Grande do Sul	Santa Maria	–29.7150	–53.7164	This Study
Brazil	Mato Grosso do Sul	Anaurilândia (rio Paraná, UHE Sérgio Motta)	–22.1850	–52.7183	SCARTOZZONI (2005)
Brazil	São Paulo	Alumínio	–23.5333	–47.2500	FRANCO et al. (1997)
Brazil	São Paulo	Barra Bonita (Usina da Barra)	–22.4833	–48.5333	FRANCO et al. (1997)
Brazil	São Paulo	Botucatu	–22.8833	–48.4500	FRANCO et al. (1997)
Brazil	São Paulo	Guarulhos (Cumbica)	–23.4333	–46.4666	FRANCO et al. (1997)
Brazil	São Paulo	Itirapina (Visconde do Rio Claro)	–22.1575	–47.7950	FRANCO et al. (1997)
Brazil	São Paulo	Itu	–23.2666	–47.3000	FRANCO et al. (1997)
Brazil	São Paulo	Mogi das Cruzes	–23.5333	–46.1833	FRANCO et al. (1997)

Continued

Table 1. *Continued.*

Country	State/province/department	Municipality (locality)	Latitude	Longitude	Source of record
Brazil	São Paulo	Mogi Guaçu	–22.3666	–46.9500	Franco et al. (1997)
Brazil	São Paulo	Mogi Mirim	–22.4333	–46.9500	Franco et al. (1997)
Brazil	São Paulo	Osasco (fábrica Eternit do Brazil, Presidente Altino)	–23.5377	–46.7666	Franco et al. (1997)
Brazil	São Paulo	Pindamonhangaba	–22.9333	–45.4666	Franco et al. (1997)
Brazil	São Paulo	Poá (Calmon Vianna)	–23.5250	–46.3333	Franco et al. (1997)
Brazil	São Paulo	Ribeirão Preto (campus USP)	–21.1750	–47.8500	Franco et al. (1997)
Brazil	São Paulo	Santa Lúcia	–21.6833	–48.0833	Franco et al. (1997)
Brazil	São Paulo	Santana de Parnaíba	–23.4416	–46.9166	Franco et al. (1997)
Brazil	São Paulo	São Bernardo do Campo	–23.7000	–46.5500	Franco et al. (1997)
Brazil	São Paulo	São Bernardo do Campo (Rudge Ramos)	–23.6583	–46.5750	Franco et al. (1997)
Brazil	São Paulo	São José dos Campos (rodovia BR–116, km 300)	–23.1500	–45.7805	Franco et al. (1997)
Brazil	São Paulo	São Manuel (Araquá)	–22.7500	–49.4875	Franco et al. (1997)
Brazil	São Paulo	São Paulo	–23.5500	–46.6333	Franco et al. (1997)
Brazil	São Paulo	São Paulo (Butantã)	–23.5666	–46.7166	Franco et al. (1997)
Brazil	São Paulo	São Paulo (Cidade Universitária)	–23.5583	–46.7166	Franco et al. (1997)
Brazil	São Paulo	São Paulo (Pinheiros)	–23.5750	–46.7000	Franco et al. (1997)
Brazil	São Paulo	São Paulo (Santo Amaro)	–23.6500	–46.7083	Franco et al. (1997)
Brazil	São Paulo	São Paulo (São Miguel Paulista)	–23.4916	–46.4416	Franco et al. (1997)
Brazil	São Paulo	Sorocaba	–23.5000	–47.4500	Franco et al. (1997)
Brazil	São Paulo	Taubaté	–23.0166	–45.5500	Franco et al. (1997)
Brazil	São Paulo	Tremembé	–22.9666	–45.5500	Franco et al. (1997)
Brazil	São Paulo	Agudos	–22.4666	–48.9833	Franco et al. (1997)
Brazil	São Paulo	Fernandópolis	–20.2833	–50.2500	Franco et al. (1997)
Brazil	São Paulo	Guarulhos	–23.4666	–46.5333	Franco et al. (1997)
Brazil	São Paulo	Jaboticabal	–21.2666	–48.3166	Franco et al. (1997)
Brazil	São Paulo	Jundiaí	–23.1833	–46.8833	Franco et al. (1997)
Brazil	São Paulo	Jundiaí (Engordadouro)	–23.1500	–46.9000	Franco et al. (1997)
Brazil	São Paulo	Campinas	–22.9000	–47.0500	Scartozzoni (2005)
Brazil	São Paulo	Juquitiba	–23.9333	–47.0666	Scartozzoni (2005)
Brazil	São Paulo	Miguelópolis	–20.1833	–48.0166	Scartozzoni (2005)
Brazil	São Paulo	Morro Agudo	–20.7333	–48.0500	Scartozzoni (2005)
Brazil	São Paulo	Morro Agudo (fazenda Sucuri)	–20.7833	–48.2000	Scartozzoni (2005)
Brazil	São Paulo	Osasco	–23.5333	–46.7833	Scartozzoni (2005)
Brazil	São Paulo	Poá	–23.5333	–46.6833	Scartozzoni (2005)
Brazil	São Paulo	Rosana (rio Paraná. Porto Primavera, UHE Sérgio Motta)	–22.4833	–52.9666	Scartozzoni (2005)
Brazil	Minas Gerais	Arcos (Calciolândia)	–20.2333	–45.6500	Franco et al. (1997)
Brazil	Minas Gerais	Três Marias (rodovia BR–040, km 289)	–18.2053	–45.2319	Silveira and Cotta (2006)
Brazil	Espírito Santo	Colatina (Itapina)	–19.5333	–40.8000	Franco et al. (1997)
Brazil	Goiás	Aporé (rio Corrente, UHE Espora)	–18.9610	–51.9237	Van–Silva et al. (2007)
Brazil	Goiás	Mineiros (Parque Nacional Emas)	–17.5746	–52.5425	Valdujo et al. (2009)
Brazil	Distrito Federal	Brasília	–15.7859	–47.8694	Franco et al. (1997)
Brazil	Bahia	Paulo Afonso (rio São Francisco, UHE Itaparica)	–09.4062	–38.2164	Silveira and Cotta (2006)
Paraguay	Itapúa	General Delgado (Represa de Yaciretá)	–27.3211	–56.5952	Scott–Jr. et al. (2007)

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